

a generating process of initial object image for generating an initial image data of a single object image based on an image data of a plurality of said reduced object images;

5 a reduced image estimating process for estimating an estimated image of each of said reduced object images from an image data of a provided single object image based on a geometric projection process;

10 an object image updating process for updating an image data of said single object image provided in said reduced image estimating process by projecting a difference between estimated images of each of said reduced object images and each of said reduced object images in an inverse process of said geometric projection process; and

15 an iterative control process for firstly giving said initial image data to said reduced image estimating process as an initial value of an image data of said single object image, and then repetitively conducting said reduced image estimating process as well as said object image updating process until said difference satisfying a predetermined condition, then outputting an image data of said single object image at the time of said difference satisfying said predetermined condition as a final image data of an object image.

## ABSTRACT OF THE DISCLOSURE

### [PROBLEMS]

To configure a single object image of higher resolution from a plurality of reduced object images focused on a photo detector by using a micro lens array.

### [MEANS FOR SOLVING PROBLEMS]

By using image data on a plurality of reduced object images, a shift amount in regard to the gap of relative positions between the reduced object images is calculated through correlation calculation between the reduced object images (S1). According to the shift amount, a conversion equation is obtained for geometric projection process from the object image to each of the reduced object images (S2). According to the image data on the plurality of reduced object images, initial image data on a single object image is generated (S3, S4). By using this as an initial value and by using the aforementioned conversion equation, estimated images of each of the reduced object images are estimated (S20). A difference between the estimated image of each of the reduced object images and each of the reduced object images is projected in the reverse process of the aforementioned geometric projection process, so as to update the image data on the single object image. These processes (S20-S50) are repeatedly executed until the difference satisfies a predetermined condition and an object image of high resolution obtained finally is outputted (S60).